Application No.: 09/417,251 Docket No.: BB1085USNA (7560*25)

REMARKS

Applicants respectfully thank the Examiner for the telephonic interviews on April 17, April 21, April 23, May 2 and May 29, 2003 and the several voice mail messages exchanged in addition. In the telephonic interview of May 29, 2003 the Examiner indicated that the utility rejection would be withdrawn in view of a sequence search showing PDIs as the most homologous proteins to Applicants' SEQ ID NO:10. Accordingly, Applicants have not addressed that rejection in these remarks.

Claims 16-20, 22-30 and 36-38 are now pending, with claim 16 being the sole independent claim. Entry of the amendment to claim 16 and cancellation of claim 17 is respectfully requested. Claim 16 has been amended without prejudice or disclaimer to replace 85% sequence identity with 90% identity. Claim 17 is cancelled as it is duplicative of now amended claim 16. Support is found at least at page 9, lines 7-9. No new matter has been added.

The specification is amended to correct reference to the priority application. Support is found in the utility transmittal letter filed with the application. A typographical error in a table heading has also been corrected.

Applicants would also like to clarify their Response mailed October 18, 2002. On page 2 and in the Appendix A to the Response, Applicants mistakenly identified the sequence of GI 2708314 as an *Arabidopsis* PDI gene when it is actually a *Chlamydomonas reinhardtii* PDI gene, as is correctly identified in the specification at page 21, line 9. Also, the Response mistakenly describes GI 2708314 on page two, last sentence of the first paragraph, which should refer to the percent identity of two PDIs, rather than two *Arabidopsis* PDIs, as only 34.8%. These errors were unintentional and are not believed to be material to the arguments presented in the Response.

In response to the Office Action, Applicants request that the rejections under written description and enablement be reconsidered and withdrawn.

Applicants have replaced the claim language from 85% sequence identity to 90% sequence identity. Furthermore, Applicants have shown in prior responses that one skilled in the art was aware that to maintain PDI activity, the two PDI catalytic

sites and the ER-retention signal should be retained but other amino acid residues may be modified.[1]

Additionally, Applicants provide herewith two alignments with recited SEQ ID NO:10 and other PDIs in Appendices 1 and 2. Appendix 1 compares SEQ ID NO:10 with known PDIs and expands on Appendix A submitted in the prior Response by adding an additional *Arabidopsis* PDI sequence to the alignment. The conserved PDI catalytic sites and ER-retention signal are boxed in Appendix 1. Appendix 2 compares SEQ ID NO:10 with the novel PDIs disclosed in the present application. One skilled in the art would appreciate that the more highly conserved a residue is, the less likely that it could be modified and function maintained. Thus, by alignments one skilled in the art would recognize easily other species within the claimed genus that are likely to have the recited PDI activity.

The Examiner asks for specific rather than general guidance on which species are within the claims. Clearly, amending the claims to 90% identity reduces the guidance needed. Also, the three retained domains characteristic of PDIs are very specific sites that would be expected to be found in the sequences within the claims. Lastly, the large number of PDI sequences available in the art and in the specification against which SEQ ID NO:10 can be compared provides specific guidance. For example, from the alignment with seven known PDI sequences in Appendix 1, a skilled artisan can see specific residues that are conserved among many sequences and expect that these residues should be conserved to obtain the claimed polynucleotides.

[1] For example, an article by Ookura et al. teaches these three conserved sequences found in PDIs. *See* Ookura et al., "Active Site Peptides with CxxC Motif on MAP-Resin Can Mimic Protein Disulfide Isomerase Activity", *Biochem. Biophys. Res. Comm.*, (1995) 213:746-751, submitted to the Examiner previously.

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In view of the foregoing, allowance of the application is earnestly solicited.

Respectfully submitted,

Christine M. Hansen

Christine M. Hansen
Registration No. 40,634
Connolly Bove Lodge & Hutz LLP
P.O. Box 2207
Wilmington, DE 19899-2207
Telephone: (302)-658-9141
Facsimile: (302)-658-5614
Attorney For Applicants

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